Excel Dynamic Solutions (Pty) Ltd

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) STUDY FOR THE PROPOSED REFORESTATION ACTIVITIES IN ORUSEU IN THE EPUPA CONSTITUENCY OF THE KUNENE REGION; NAMIBIA

ENVIRONMENTAL ASSESSMENT REPORT: FINAL REPORT

ECC APPLICATION NUMBER – 001803

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Excel Dynamic Solutions (Pty) Ltd

EXECUTIVE SUMMARY

Sadhana Forest Namibia (The Proponent) proposes to establish and operate a land restoration project at the Oruseu Village of the Epupa Constituency in the Kunene Region, through water conservation and planting of indigenous as well as drought-resistant food-bearing trees. The project will also entail the training of local people in land restoration, water conservation, and reforestation. The proposed project site is located about 85km northwest of Opuwo as shown on the locality map in Figure 1 below. The project site will cover about 15 hectares (Ha) of land, which will be marked off by a 1,762m boundary fencing.

In terms of the Environmental Management Act (EMA) No.7 of 2007 and its 2012 EIA Regulations, the proposed project (reforestation) triggers listed activities that cannot be undertaken without an ECC. Subsequently, to ensure that the proposed activity is compliant with the national environmental legislation, the project Proponent appointed an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd to undertake the required Environmental Assessment (EA) process and apply for the ECC on their behalf.

The application for the ECC was compiled and submitted to the competent authority (Ministry of Environment, Forestry and Tourism (MEFT)) as the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP), an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

Brief Project Description

Planned Activities:

Once an ECC is issued and all administrative and technical tasks are completed, the Proponent may begin with the establishment of works on site. There will be some light preparatory works on site for the establishment and installation of necessary infrastructure and structures required for the project activities. The general site works will include a land restoration training center and a tree sapling nursery. All structures to be erected on site will be light and low impact, and the power supply of the operations at the center (site) will rely only on solar energy. During the operational phase, indigenous trees will be planted and grown on the site and throughout the community. Local people will also be trained on land restoration and water conservation. This will be under the supervision, management, and maintenance of Sadhana Forest Namibia.

Public Consultation

Public Consultation Activities

Regulation 21 of the EIA Regulations details steps to be taken during a public consultation process and these have been used in guiding this process. The public consultation process assisted the Environmental Consultant in identifying all potential impacts and aid in the process of identifying possible mitigation measures and alternatives to certain project activities. The communication with I&APs about the proposed prospecting and reforestation activities was done through the following means and in this order to ensure that the public is notified and afforded an opportunity to comment on the proposed project:

- A Background Information Document (BID) containing information about the proposed Reforestation activities was compiled and delivered to relevant Authoritative Ministries, and upon request to all new registered Interested and Affected Parties (I&APs).
- Project Environmental Assessment notices were published in The Namibian and New Era Newspapers (12th and 19th April 2023) briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the I&APs on the 26th of April 2023 at Oruseu Water point (under the tree) at 12h00.
- All issues and concerns raised during the public consultation meeting and additional information obtained during our site visit are founding the basis for the ESA Report and EMP.

Potential Impacts identified.

The following potential impacts are anticipated:

- **Positive impacts**: Promotes ecological restoration (plant biodiversity) in the area, enhances the aesthetic of the landscape, improves the ecosystem's resilience to drought and land degradation, empowerment and transfers of skills to locals through training, enhances local food production and access (food security), promotes eco-tourism in the area and improves Carbon sinks, etc. The project will also improve water security for the community by replenishing the aquifer (water table) significantly over time, providing better access to water from all surrounding wells.
- **Negative impacts**: Impact on water resources (groundwater) through over-abstraction to supply the proposed activities onsite, environmental pollution (waste generation/littering), impact on local livestock (restricted movement), risk of veld fires, health and safety: improper handling of materials and equipment may cause occupational health hazards, archaeological or cultural heritage impact through uncovering of unknown objects on site (when carrying out earthworks), socio-economic issues (conflicts with locals, vandalism/theft of fence, water pipe and seedling).

The potential negative impacts were assessed, and mitigation measures were provided accordingly.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The potential impacts that are anticipated from the proposed project activities were identified, described, and assessed. For the significant adverse (negative) impacts with a medium rating, appropriate management, and mitigation measures were recommended for implementation by the Proponent.

The public was consulted as required by the EMA and its 2012 EIA Regulations (Section 21 to 24). This was done via the two newspapers (New Era and The Namibian) used for this environmental assessment. A consultation through a face-to-face meeting with directly affected landowners at Oruseu water point (under the tree) was carried out, whereby all raised comments and concerns on the proposed project activities were registered and addressed by the consultant.

The issues and concerns raised by the registered I&APs formed the basis for this Report and the Draft EMP. The issues were addressed and incorporated into this Report, whereby mitigation measures have been provided thereof to avoid and/or minimize their significance on the environmental and social components. Most of the potential impacts were found to be of medium-rating significance. With the effective implementation of the recommended management and mitigation measures, it will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low). To maintain the desirable rating, it is highly recommended that the Proponent appoints an Environmental Control Officer (ECO) to monitor the implementation of management and mitigation measures directly. The monitoring of this implementation will not only be done to maintain the reduced impacts' rating or maintain a low rating but to also ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away too.

It is crucial for the Proponent and their contractors, as well as for the effective implement of the recommended management and mitigation measures, to protect both the biophysical and social environment throughout the project duration. All these activities would be followed with the aim of promoting environmental sustainability while ensuring a smooth and harmonious existence and purpose of the project activities in the community and the environment at large.

Recommendations

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put into monitoring the implementation of these measures.

It is, therefore, recommended that the proposed reforestation activities be granted an ECC, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.

- All required permits, licenses, and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensure compliance with these specific legal requirements.
- The Proponent and all their project workers or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Environmental Compliance monitoring reports should be compiled and submitted to the DEAF Portal as per the provision made on the MEFT/DEAF's portal.

Disclaimer

Excel Dynamic Solutions (EDS) warrants that the findings and conclusion contained herein were accomplished in accordance with the methodologies set forth in the Scope of Work and Environmental Management Act (EMA) of 2007. These methodologies are described as representing good customary practice for conducting an EIA of a property for the purpose of identifying recognized environmental conditions. There is a possibility that even with the proper application of these methodologies there may exist the subject property conditions that could not be identified within the scope of the assessment, or which were not reasonably identifiable from the available information. The Consultant believes that the information obtained from the record review and during the public consultation processes concerning the proposed reforestation work is reliable. However, the Consultant cannot and does not warrant or guarantee that the information provided by the other sources is accurate or complete. The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluations. No other warranties are implied or expressed.

Some of the information provided in this report is based upon personal interviews, and research of available documents, records, and maps held by the appropriate government and private agencies. This report is subject to the limitations of historical documentation, availability, and accuracy of pertinent records, and the personal recollections of those persons contacted.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae
DEA	Department of Environmental Affairs

EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
ESA	Environmental Scoping Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
I&Aps	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
PPE	Personal Protective Equipment
Reg	Regulation
S	Section
TOR	Terms of Reference
REDDS	Reducing Emissions from Deforestation and forest Degradation
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.

Biophysical	That part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes).
Cumulative Impacts/Effects Assessment	In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
Ecological Processes	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environment	As defined in the Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled and monitored.

Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity. Mitigate - practical measures to reduce adverse impacts. Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. Significant impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Fauna	All of the animals that are found in a given area.
Flora	All of the plants found in a given area.
Indigenous	originating or occurring naturally in a particular place
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.
Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Nomadic Pastoralism	Nomadic pastoralists live in societies in which the husbandry of grazing animals is viewed as an ideal way of making a living and the regular movement of all or part of the society is considered a normal and natural part of life. Pastoral nomadism is commonly

	found where climatic conditions produce seasonal pastures but cannot support sustained agriculture.
Proponent	Organization (private or public sector) or individual intending to implement a development proposal.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
Terms of Reference (ToR)	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.
Reforestation	This the process of replanting trees in areas that have been affected by natural disturbances like wildfires, drought, and insect and disease infestations — and unnatural ones like logging, mining, agricultural clearing, and development.
Forest Restoration	This is process of returning trees to former forest land and improving the condition of degraded forests

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1 INTRODUCTION

1.1 Project Background

Sadhana Forest Namibia (The Proponent) proposes to establish and operate a land restoration project at the Oruseu Village of the Epupa Constituency in the Kunene Region, through water conservation and growing of indigenous and drought-resistant food-bearing trees. The project also entails training of local residents in land restoration, water conservation, and reforestation processes. The proposed project site is located about 85km northwest of Opuwo as shown on the locality map in **Figure 1** below. The project site will cover about 15 ha of land, marked off by 1,762m boundary fencing.

Section 27 (1) of the Environmental Management Act (EMA) (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations, provides a list of activities that may not be carried out without an EIA undertaken and an ECC obtained. Reforestation and all forestry-related activities are listed among activities that may not occur without an ECC. Therefore, individuals or organizations may not carry out reforestation activities without an ECC awarded to the Proponent.

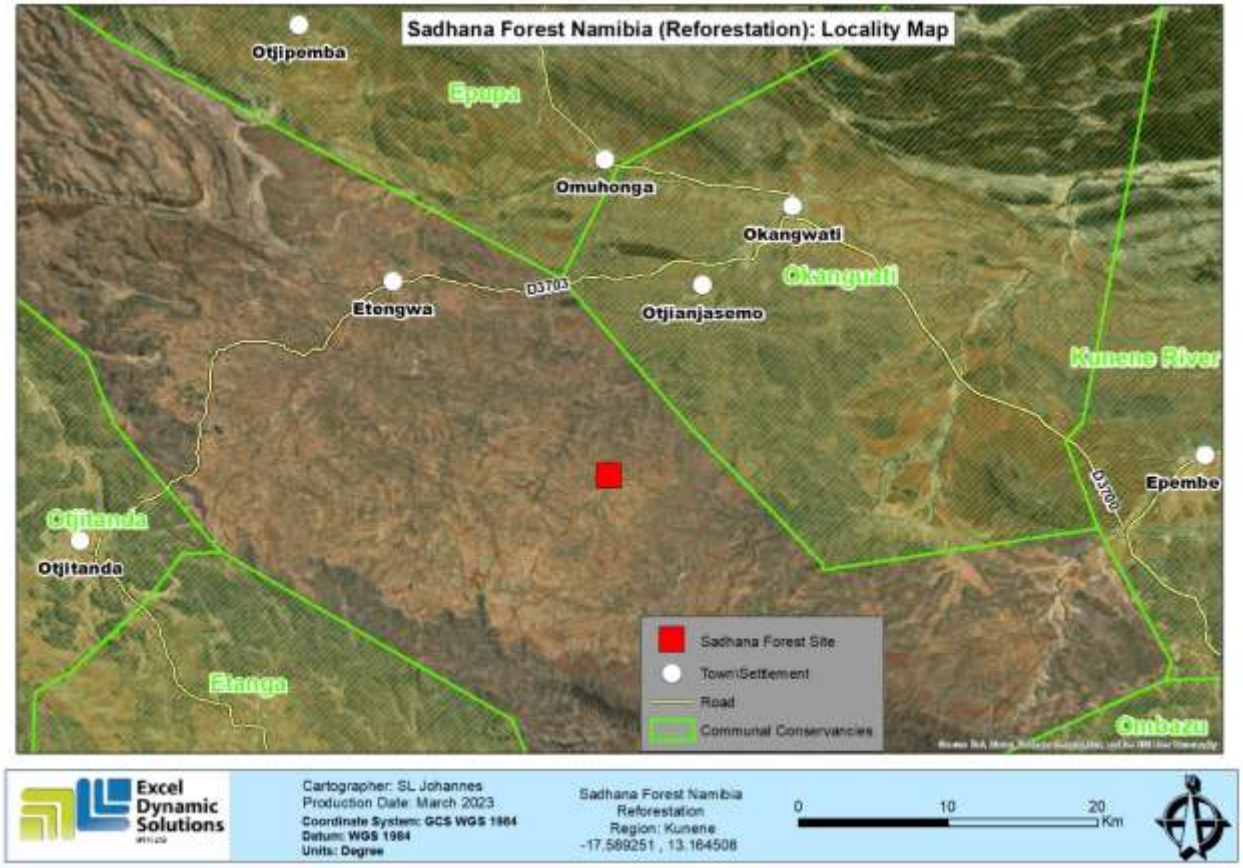

Figure 1: Locality map of the proposed reafforestation project

1.2 Terms of Reference, Scope of Works and Appointed EA Practitioner

To satisfy the requirements of the EMA and its 2012 EIA Regulations, the Proponent appointed EDS to conduct the required Environmental Assessment (EA) process on their (Proponent's) behalf, and thereafter, apply for an ECC for the proposed reafforestation activities. There were no formal Terms of Reference (ToR) provided to EDS by the Proponent. The consultant, instead, relied on the requirements of the Environmental Management Act (No. 7 of 2007) (EMA) and its EIA Regulations (GN. No. 30 of 2012) to conduct the study.

The application for the ECC (**Appendix A**) is compiled and submitted to the Ministry of Environment, Forestry, and Tourism (MEFT), the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP) (**Appendix B**), an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT Department of Environmental Affairs and Forestry (DEAF).

The EIA project is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced EAP. The consultation process and reporting process are done by Ms. Aili Iipinge and Mr. Leonard Mandume and reviewed by Ms. Rose Mtuleni. Mr. Nerson Tjelos, Mr. Mandume Leonard and Ms. Aili Iipinge's CVs are presented below in **Appendix C.**

1.3 Motivation for the Proposed Project

Sadhana Forest is a global non-profit organization that assists mainly rural communities with ecological restoration and food security. Sadhana Forest works to improve food insecurity through training local people in water conservation, reforestation permaculture, education, and ecological restoration. Sadhana Forest aims to plant indigenous tree species in zones that have been devastated by deforestation, which is commonly a result of increased overgrazing, illegal logging, fires, and fuel wood harvesting.

Sadhana Forest recognizes the negative impact that increasing climate disasters and the depletion of natural resources have on communities. These disasters and the depletion of resources are oftentimes human-created and result in communities losing their livestock and families having to migrate from their land. Sadhana Forest works to address these issues by

educating the thousands of local and international volunteers that they receive each year about sustainable living patterns.

Sadhana Forest Namibia is interested in implementing a reforestation project in the dry and rural Kunene Region, which is one of the most food-insecure parts of Namibia. The issuing of the ECC for this proposed project would mean that this proposed project may commence and contribute towards achieving the goals of building climate resilience and establishing long-term food security in rural arid areas through water conservation and planting indigenous drought-resistant food-bearing trees. **Figure 2** below shows images from projects carried out by Sadhana Forest in other countries (India, Kenya and Haiti) where Sadhana Forest has done reforestation activities over the past years.

Figure 2: The visual of sites before and after reforestation activities were practiced

2 PROJECT DESCRIPTION

If an ECC is issued by the MEFT and all administrative and technical tasks are completed, the Proponent may begin with the establishment of works on site. There will be some light preparatory works on site for the establishment and installation of necessary infrastructure and structures required for the project activities. The general site will include a training center for land restoration and a nursery for tree saplings. All structures to be erected on site will be light and low impact, and the power supply of the operations at the center (site) will rely only on solar energy. During the operational phase, indigenous trees will be planted and grown on the site and local people will be trained on land restoration and water conservation. This will be under the supervision, management, and maintenance of Sadhana Forest Namibia.

The planned project activities/requirements in terms of input, processes, and outputs are outlined below. The description of these project activities will ease the identification of the potential impacts, particularly the negatives impact which are the focus of the ESA. The project activities are provided based on implementation phases. These phases are explained as follows:

2.1 Planning and Design Phase

Before fencing the area, the site layout and works need to be planned for and designed. Indigenous trees that are proposed to be planted on site are species that have evolved in the same area, region, or biotope where the forest stand is growing and are adapted to the specific ecological conditions predominant at the time of the establishment of the stand.

The planning and design phase, which also includes the ESA is aimed at presenting some key concepts of the project alongside a general overview of the study area, the legal landscape to be considered, and a preliminary assessment of the main aspects that might affect the feasibility of the project and or its associated activities. Thereafter, the environmental, technical, and financial aspects of the project are assessed by identifying potential risks and proposing mitigation measures where possible. This would also include highlighting 'fatal flaws' wherever mitigation measures are unavailable or impractical concerning the available finances and other resources. Prior to the commencement of any site work, all personnel (including fully employed, contracted, and casual) will be inducted on the Proponent's Environmental, Health, and Safety Policy as well as procedures and processes to follow while conducting the work on-site or offsite work related to the project. Consultations, particularly with competent and relevant government stakeholders will commence to notify them of the commencement of project groundwork. **Figure 3** shows the site layout of the proposed site.

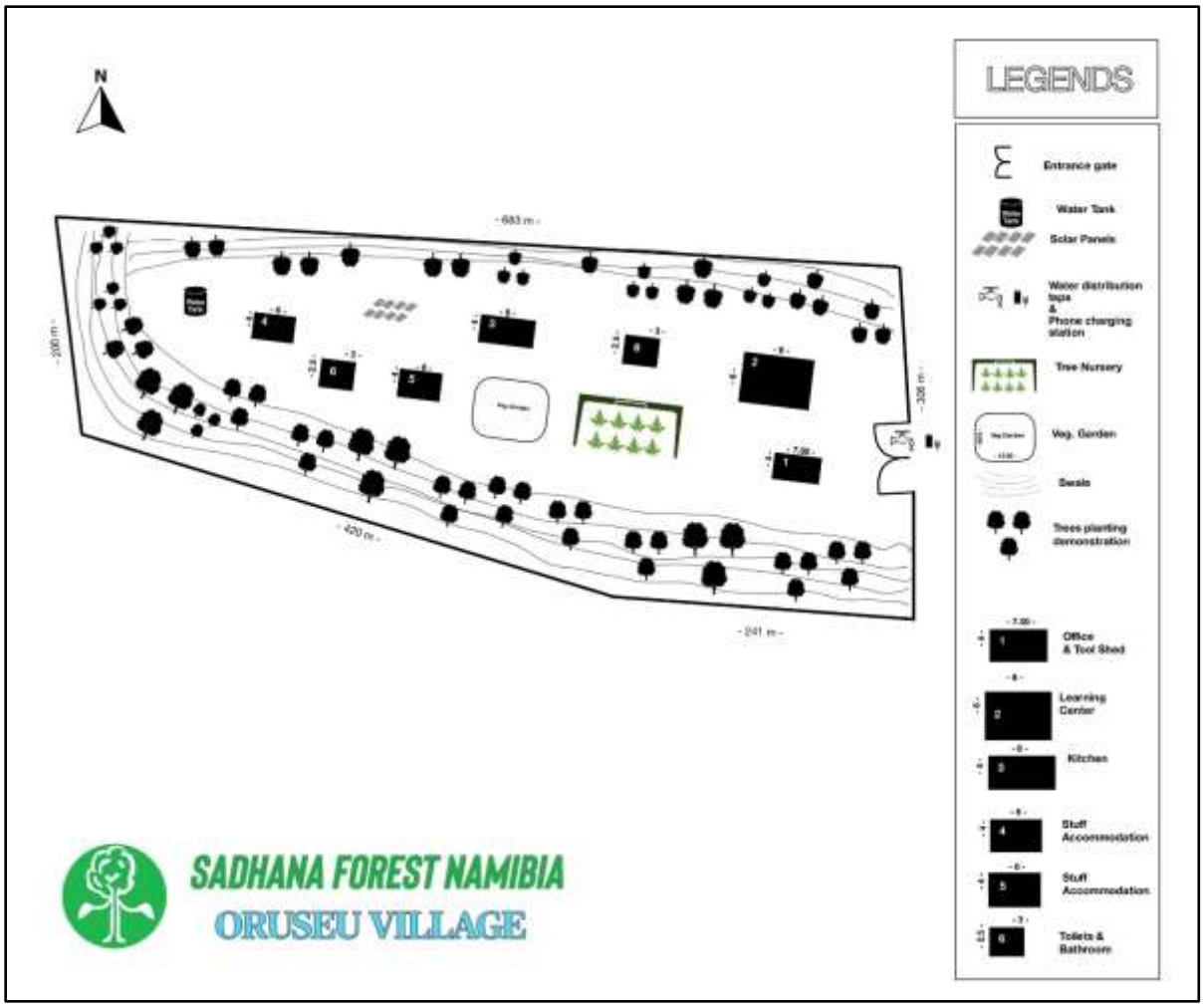

Figure 3: The site layout of the proposed reforestation project

2.2 Project Input and Resources Requirements

In terms of inputs and resources to undertake the proposed reforestation activities, the following will be required:

- Electric Vehicles (4x4 bakkies to be charged by the project solar energy system), no diesel vehicles or heavy machinery will be used.
- Structure/facilities such as camping, offices, and or administration rooms as well as ablution. Ablutions will be of dry composting style resulting in zero effluent waste disposal.
- Hoses, pipes, irrigation controllers, sprinkler heads, pumps, nets, and poles.
- Storage facilities for project equipment and materials as well as containers (water, tools

- and other supplies).
- In terms of services infrastructure and human resources, the following will be required:

2.2.1 Project Personnel and Accommodation

The number of project personnel (staff) for setting up the project site (construction) is expected to be 10 people. Similarly, the number of people to volunteer employed for the actual reforestation works is expected to be 4. Accommodation provision for the construction and operation phases is planned as follows:

• Phase I (Fencing off phase and land preparation): In terms of accommodation for the fencing off and construction phase of the office facility, it is anticipated that the project staff will be accommodated in temporary accommodation (tented campsite) within the site.

• Phase II (Planting and Operational phase): For the operational phase, permanent light impact accommodation facilities, similar to local hut dwellings will be constructed on-site.

2.2.2 Water Supply Requirements

Water supply for both the construction and actual reforestation activities will be sourced from a borehole. A suitable and viable location within the allocated land plot has been determined by an experienced geo/hydrologist for onsite domestic water use (including drinking), there will be industry-standard water storage tanks onsite that will be refilled from bore.

2.2.3 Power supply

The power required for construction work as well as during the operational phase will be supplied solely by renewable energy (in the form of photovoltaic/solar). There will be no requirement for connection to the electricity grid at any stage of the project.

2.2.4 Sanitation

During construction and operation, the site will be equipped with enough dry composting toilet systems to service all staff and construction team.

2.2.5 Site Access (Roads)

The project site is accessible via the D3703 (the gravel to Okanguati) road, that connects to existing minor routes leading to the site.

2.2.6 Health and safety

All project workers (for all the site project phases) will be well equipped with Personal Protective Equipment (PPE) while performing tasks on site. A minimum of two standard first aid kids will be available on site.

2.2.7 Site Fencing

The project is anticipated to be undertaken land on which Sadhana Forest Namibia obtained customary/leasehold rights; the site will be fenced off. This will increase security and limit access (controlled site movements to certain areas for safety and security reasons) and prevent the saplings from being destroyed by livestock or wildlife.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section highlights the different ways in which the project can be undertaken and identifies alternatives that may be the most practical, but least damaging to the environment.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “no action” alternative implies that the status quo remains. Should the proposal of reafforestation activities on the proposed site be discontinued, none of the potential impacts (positive and negative) identified would occur. If the proposed project is to be discontinued, the current land use for the proposed site would remain unchanged.

This no-go option is considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative, is undertaken to establish what benefits might be lost if the project is not implemented. The key losses that may never be realized if the proposed project does not go ahead include:

- No promotion of ecological restoration in the area
- No increase in biodiversity (plant and animal)
- No increase to aquifer levels and therefore no improvement to water access for surrounding areas
- No improvement in the ecosystem’s resilience to drought and land degradation
- Empowerment and transfer of skills to locals through training will not occur

- No improvement in food insecurity of local people
- Hinders eco-tourism activity in the area
- No improvement in the Carbon sinks

Considering the above losses, the “no-action/go” alternative may not necessarily be considered a viable option for this project, although, in the case where parts of the project site are considered environmentally sensitive and/or protected, one or several sections of the site may be identified as no-go zones.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES, AND GUIDELINES

Reforestation and all forest-related activities have legal implications associated with certain applicable legal standards. A summary of applicable and relevant international policies and Namibian legislation, policies, and guidelines for the proposed development is given in this section (**Table 1**). This summary serves to inform the project Proponent, Interested and Affected Parties, and the decision-makers at the DEAF, of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the proposed reforestation activities.

4.1 The Environmental Management Act (No. 7 of 2007)

This EIA was carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30).

The EMA has stipulated requirements to complete the required documentation to obtain an ECC for permission to undertake certain listed activities. These activities are listed under the following Regulations:

4. Forestry Activities

The clearance of forest areas, deforestation, afforestation, timber harvesting, or any other related activity that requires authorization in terms of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.

Associated listed activities (Groundwater management)

8. Water Resource Development

8.1 The abstraction of ground or surface water for industrial or commercial purposes.

The Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878) detail requirements for public consultation within a given environmental assessment process (GN 30 S21). The EIA regulations also outline the required details of a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).

Other legal obligations that are relevant to the proposed activities of reforestation activities and related activities are presented in Table 1.

Table 1: Applicable local, national, and international standards, policies, and guidelines governing the proposed development.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
The Constitution of the Republic of Namibia, 1990 as amended: **Government of the Republic of Namibia**	The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include: "…the duty to investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the: "…Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State."	By implementing the environmental management plan, the establishment will be conformant to the constitution in terms of environmental management and sustainability. Ecological sustainability will be the main priority for the proposed development.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Nature Conservation Amendment Act, No. 3 of 2017: **Ministry of Environment, Forestry and Tourism (MEFT)**	The Ordinance provides a legal framework that protects objects/structures such as geological, ethnological, archaeological, and historical within the project area.	The Proponent will be required to enhance the conservation of biodiversity and the maintenance of the ecological integrity of the areas.
Health & Safety Regulations, GN 156/1997(GG1617): **Ministry of Health and Social Services (MHSS)**	Makes provision for the health and safety of persons employed or otherwise present in areas. These deal with among other matters; clothing and devices; design, use, operation, supervision, and control of machinery; fencing and guards; and safety measures during repairs and maintenance.	The Proponent should. comply with all these regulations concerning their employees.
The Regional Councils Act (No. 22 of 1992)**: Ministry of Urban and Rural Development (MURD)**	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning perspective, their duties include, as described in section 28 “to undertake the planning of the development of the region for which it	The relevant Regional Councils are IAPs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Kunene

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	has been established with a view to physical, social and economic characteristics, urbanization patterns, natural resources, economic development potential, infrastructure, land utilization pattern and sensitivity of the natural environment.	Regional Council; therefore, they should be consulted.
Traditional Authority Act (Act No. 25 of 2000): Ministry of Urban and Rural Development (MURD)	The Act also stipulates that Traditional Authorities (TAs) should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. This Act implies that TAs must be fully involved in the planning of land use and development for their area. It is the responsibility of the TA's customary leadership, the Chiefs, to exercise control on behalf of the state and the residents in their designated area.	The reforestation considered under this project is predominantly located in the Epupa Constituency within the communal area. Therefore, the community members should be consulted throughout the Project.
Water Act 54 of 1956**: Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Water Resources Management Act 11 of 2013 is present without regulations; therefore, the Water Act No 54 of 1956 is still in force: It prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).	The protection (both quality and quantity/abstraction) of water resources should be a priority. The permits and license required thereto should be obtained from MAWLR's relevant Departments (these

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	The Act provides for the control and protection of groundwater (S66 (1), (d (ii)). It also regulates liability for clean-up costs after the closure/abandonment of an activity (S3 (l)). (l)).	permits include Borehole Drilling Permits, Groundwater Abstraction & Use Permits, and when required, Wastewater / Effluent Discharge Permits).
Water Resources Management Act (No 11 of 2013)**: Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Act provides for the management, protection, development, use, and conservation of water resources; provides for the regulation and monitoring of water services, and provides for incidental matters. The objects of this Act are to: Ensure that the water resources of Namibia are managed, developed, used, conserved, and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (S68).	
National Heritage Act No. 27 of 2004**: Ministry of Education, Arts,**	To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects;	The Proponent should ensure compliance with this act's requirements. The necessary management

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
and Culture (MEAC)	to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.	measures and related permitting requirements must be taken. This is to be done by consulting with the National Heritage Council (NHC) of Namibia. The management measures should be incorporated into the Draft EMP.
The National Monuments Act (No. 28 of 1969)**: Ministry of Education, Arts, and Culture (MEAC)**	The Act enables the proclamation of national monuments and protects archaeological sites.	
Soil Conservation Act (No 76 of 1969)**: Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Act makes provision for the prevention and control of soil erosion and the protection, improvement, and conservation of soil, vegetation, and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001**: Ministry of Environment, Forestry and Tourism (MEFT)**	The Act provides for the management and use of forests and forest products. Section 22. (1) provides: "Unless otherwise authorized by this Act, or by a license issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No.	The proponent will apply for the relevant permit under this Act if it becomes necessary.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	23 of 1992) cut, destroy or remove - (a) vegetation which is on a dune or drifting sand or a gully unless the cutting, destruction or removal is done to stabilize the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."	
Public Health Act (No. 36 of 1919)**: Ministry of Health and Social Services (MHSS)**	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617)**: Ministry of Health and Social Services (MHSS)**	Details various requirements regarding the health and safety of laborers.	
Public and Environmental Health Act No. 1 of 2015**: Ministry of Health and Social Services (MHSS)**	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition	The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are designed and operated in a way that is safe, or not injurious or dangerous to

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	liable to be injurious or dangerous to health.	public health and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels. Public and environmental health should be preserved and remain uncompromised.
Atmospheric Pollution Prevention Ordinance (1976)**: Ministry of Health and Social Services (MHSS)**	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for section 4(1) (a) of the ordinance.	The proposed project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented on-site.
Hazardous Substance Ordinance, No. 14 of 1974**: Ministry of Health and Social Services (MHSS)**	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal, and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment
Road Traffic and Transport Act, No.	The Act provides for the establishment of the Transportation Commission of	Mitigation measures should be provided for, if the roads

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
22 of 1999**: Ministry of Works and Transport (Roads Authority of Namibia)**	Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access to existing roads, the relevant permits will be required.	and traffic impact cannot be avoided, the relevant permits must be applied for.
Labour Act (No. 6 of 1992)**: Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)**	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety, and enhanced labour market services for the benefit of all Namibians. This ministry ensures the effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the prospecting and reforestation activities do not compromise the safety and welfare of workers.

4.2 International Policies, Principles, Standards, Treaties, and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are listed in Table 2 below.

Table 2: International Policies, Principles, Standards, Treaties and Convention applicable to the project

Statute	Provisions	Project Implications
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The principles apply to all new project financings globally across all sectors. Principle 1: Review and Categorization Principle 2: Environmental and Social Assessment Principle 3: Applicable Environmental and Social Standards Principle 4: Environmental and Social Management System and Equator Principles Action Plan Principle 5: Stakeholder Engagement Principle 6: Grievance Mechanism Principle 7: Independent Review Principle 8: Covenants Principle 9: Independent Monitoring and Reporting	These principles are an attempt to: '…encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'

Statute	Provisions	Project Implications
	Principle 10: Reporting and Transparency	
The International Finance Corporation (IFC) Performance Standards	The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below. Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts Performance Standard 2: Labour and Working Conditions	The Performance Standards are directed toward clients, guiding how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business sustainably, including stakeholder engagement and disclosure obligations of the Client (Borrower) concerning project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the

Statute	Provisions	Project Implications
	Performance Standard 3: Resource Efficient and Pollution Prevention and Management Performance Standard 4: Community Health and Safety Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities Performance Standard 8: Cultural Heritage Performance Standard 9: Financial Intermediaries (FIs) Performance Standard 10: Stakeholder Engagement and Information A full description of the IFC Standards can be obtained from http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-	Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives.

Statute	Provisions	Project Implications
	social-standards?cq_ck=1522164538151#ess1	
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention's objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability (United Nations Convention).	The project activities should not be such that they contribute to desertification. All activities of this particular project are in-line with the convention
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, to ensure their conservation and sustainable use. Promote the protection of ecosystems, and natural habitats, and the maintenance of viable populations of species in natural surroundings.	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimized.
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

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Relevant international Treaties and Protocols ratified by the Namibian Government

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992.
- World Heritage Convention, 1972.
- United Nations Convention to Combat Desertification
- United Nations Framework Convention on Climate Change

5 ENVIRONMENTAL BASELINE

The proposed reforestation activities will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in providing background "information" on the status quo and future projections of environmental conditions after proposed works on the site has been done. This also helps the EAP in identifying the sensitive environmental features that may need to be protected through the recommendations and effective implementation of mitigation measures provided.

The baseline information presented below is sourced from a variety of sources including reports of studies conducted in the Kunene Region. Further information was obtained by the Consultant during the site visit.

5.1 Biophysical Environment

5.1.1 Climate

Climate has a major influence on reafforestation activities. An understanding of climatic conditions helps to determine the appropriate and/or inappropriate times to conduct reforestation activities.

The area around Okanguati which includes the Oruseu area has relatively constant temperatures for most of the year. Seasons and temperatures vary during the year. The months of September to February are the warmest with an average temperature of 31.1 ^{0}C – 33.1 ^{0}C.

The highest rainfall in the project area is usually experienced in January and February which may reach an average of approximately 73 mm. The general amount of rainfall received in the Region is not deemed high enough or disastrous to put reforestation works to a complete standstill. Little to no rainfall periods are recorded from May to September with an average of 0 – 2 mm.

The relative humidity during the least humid months of the year, i.e. August to September is around 20% and 18%, respectively. Namibia has a low humidity in general and the lack of moisture in the air has a major impact on its climate, reducing cloud cover increases the rate of evaporation (Mendelsohn, 2002). **Figure 4** show the climate data around the project area.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	24.7 °C (76.4) °F	24.3 °C (75.8) °F	23.6 °C (74.6) °F	22.3 °C (72.1) °F	20.1 °C (68.2) °F	16.9 °C (62.4) °F	16.7 °C (62.1) °F	19.2 °C (66.5) °F	22.5 °C (72.5) °F	24.7 °C (76.5) °F	24.8 °C (76.7) °F	25 °C (77) °F
Min. Temperature °C (°F)	18.3 °C (65) °F	18.4 °C (65.2) °F	18.1 °C (64.5) °F	16.1 °C (61) °F	13.1 °C (55.6) °F	9.6 °C (49.3) °F	9.4 °C (48.9) °F	10.8 °C (51.5) °F	13.5 °C (56.4) °F	16.2 °C (61.1) °F	16.9 °C (62.4) °F	17.8 °C (64) °F
Max. Temperature °C (°F)	31.8 °C (89.3) °F	30.9 °C (87.6) °F	29.6 °C (85.3) °F	28.5 °C (83.2) °F	27 °C (80.6) °F	24.5 °C (76.1) °F	24.3 °C (75.8) °F	27.4 °C (81.4) °F	31.1 °C (87.9) °F	33.1 °C (91.5) °F	32.9 °C (91.1) °F	32.7 °C (90.9) °F
Precipitation / Rainfall mm (in)	72 (2)	73 (2)	68 (2)	29 (1)	2 (0)	0 (0)	0 (0)	0 (0)	2 (0)	9 (0)	23 (0)	38 (1)
Humidity(%)	43%	48%	51%	44%	31%	29%	26%	20%	18%	21%	27%	33%
Rainy days (d)	7	8	7	3	0	0	0	0	0	2	3	4
avg. Sun hours (hours)	11.3	10.7	10.3	10.2	9.9	9.7	9.8	10.2	10.8	11.3	11.7	11.9

Figure 4: The climate data around the project area

5.1.2 Topography

The topography of the Kunene Region is mainly mountainous; thus the site is found within a mountainous area. The site lies within the Etanga Epembe Plain. The topography map of the proposed site is shown in **Figure 5** below.

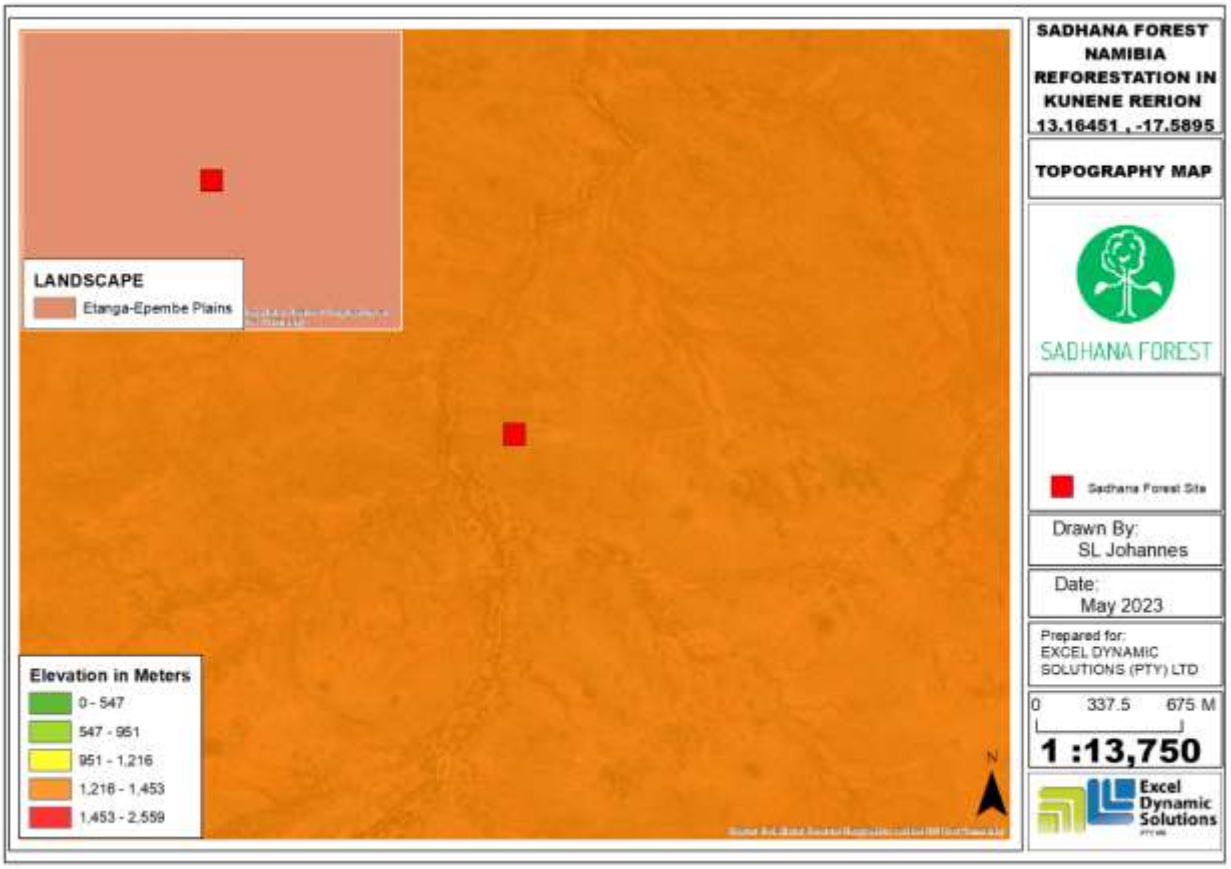

Figure 5: The topography of the project area

5.1.2 Geology

The geology of the area comprises units of the Huab Basin Group which forms part of the Karoo Supergroup and is surrounded by outcrops of the Epupa, Huab, and Abbabis Metamorphic Complexes (Cx), which is the oldest lithological unit in Namibia (2 600-1 650 Ma). The Karoo supergroup is the most widespread stratigraphic unit in Africa south of the Kalahari Desert. The supergroup consists of a sequence of units, mostly of nonmarine origin, deposited between the Late Carboniferous and Early Jurassic, a period of about 120 million years (Mendelsohn et al, 2002). **Figure 6** below shows the geology map of the project area and **Figure 7** shows the the rock unit found within the project area.

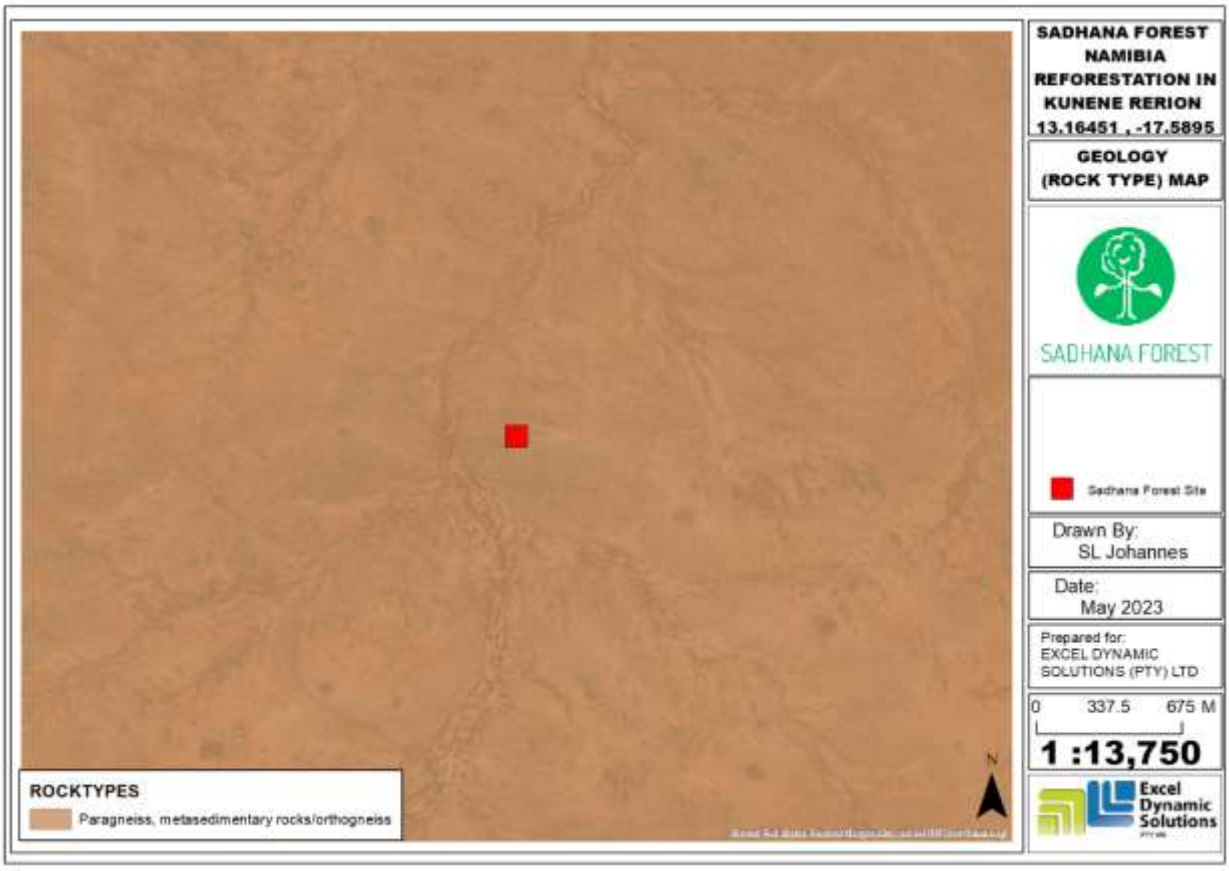

Figure 6: A map of the general geology of the project area

Figure 7: Rocks observed on the site

5.1.3 Soil

The project area is dominated by the Chromic Cambisols. Chromic Cambisols are typically developed on parent materials that are rich in iron and aluminum oxides. They are generally deep soils with well-developed horizons or layers, showcasing some degree of weathering and mineral leaching. These soils often have a distinct reddish-brown to reddish-yellow color, which is indicative of the presence of iron oxides. They are commonly found in regions with a semi-arid to arid climate and are associated with different geological formations. These soils play an essential role in supporting vegetation and agriculture in the areas where they occur (Nitzsche et al. 2019). The sources of dust associated with the proposed reforestation work activities may be experienced during fencing off the area when digging holes to put in the poles and the creation of access roads if necessary. These activities may have a minor impact on the neighboring community. **Figure 8** below shows the soil types map in the project area.

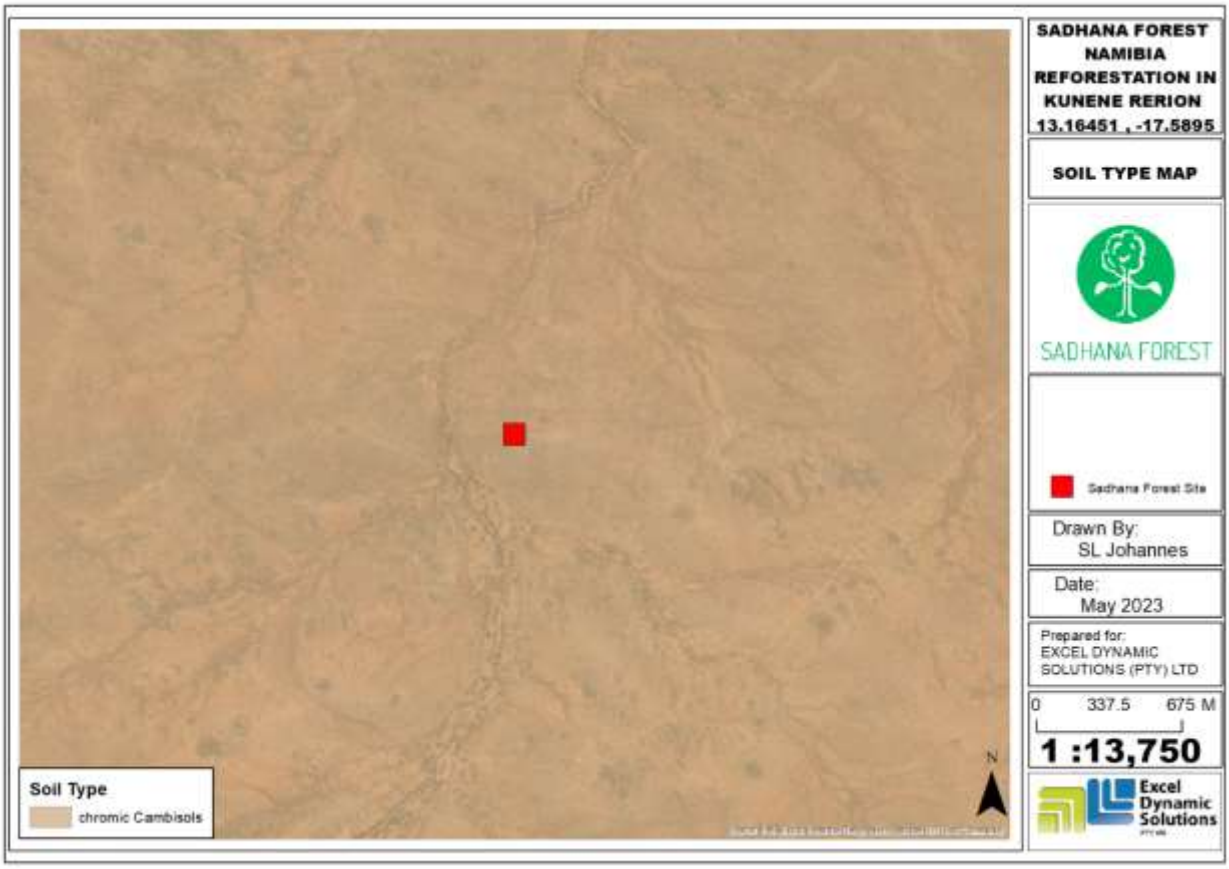

Figure 8: Dominant soil types on the site

5.1.4 Hydrology, Groundwater Vulnerability to Pollution, and Water Resources

In terms of surface water/ hydrology, the site is mainly covered by rock bodies with little groundwater potential. This means that there is limited storage capacity, transmission, and flow of groundwater. **Figure 9** shows the hydrology map around the project area.

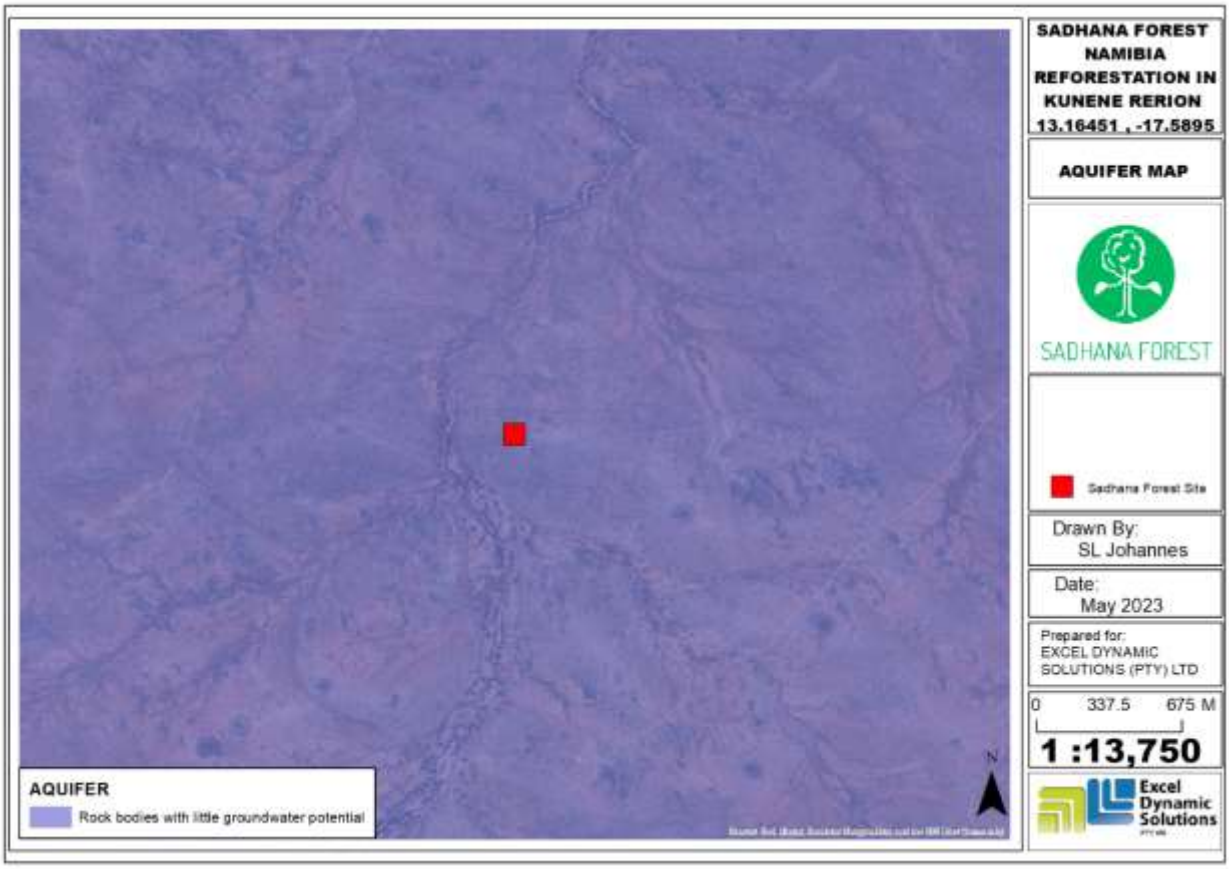

Figure 9: Hydrology map of the project area.

5.1.5 Flora and Fauna

5.1.5.1 Flora

The site falls within a Sparsed Shrub vegetation type. The vegetation within the study site is dominated by Mopane trees (*Colophospermum mopane*) and Purple-pod terminalia (*Terminalia prunioides*). Various Commiphora species and Sterculia Africana are found in the site area but sparsely. **Figure 10** shows the vegetation map around the proposed site and **Figure 11** shows the plant species observed onsite.

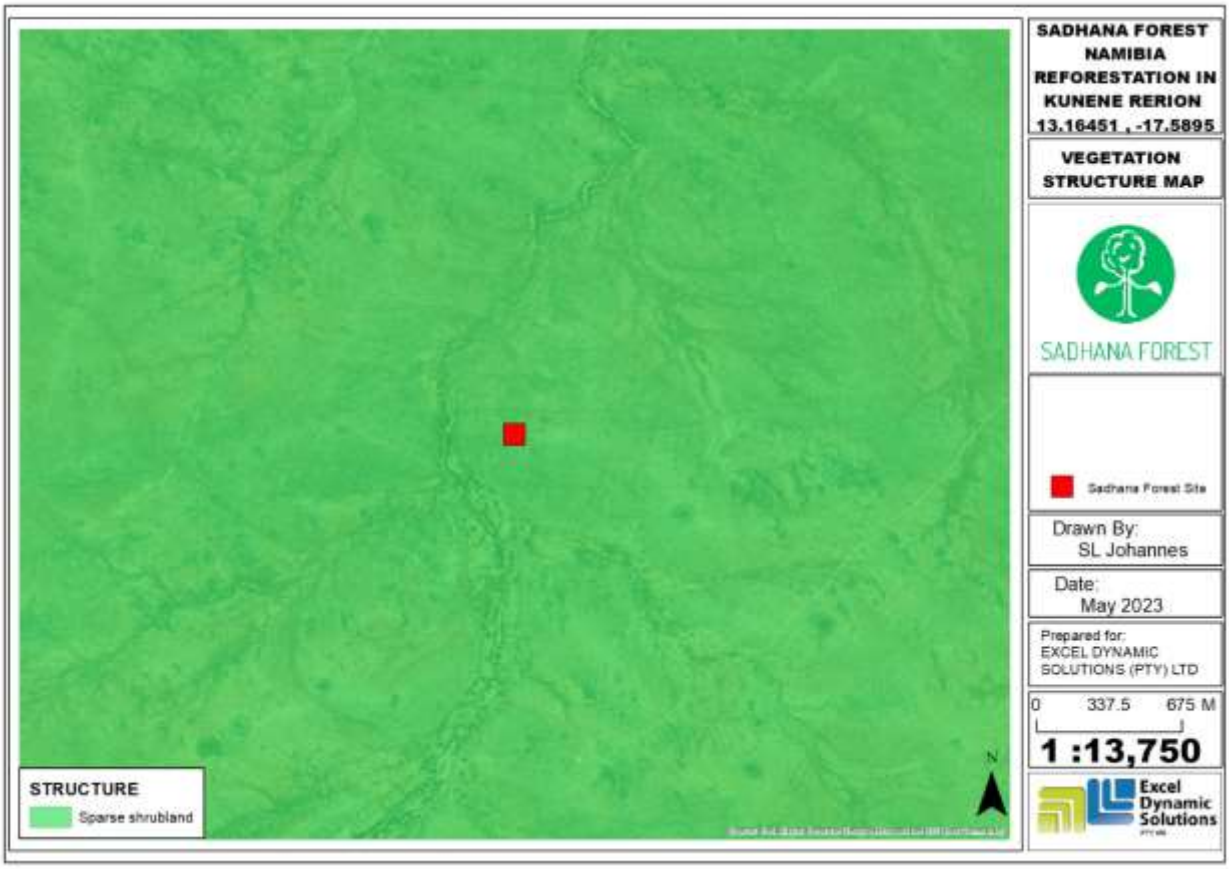

Figure 10: Vegetation map of the project

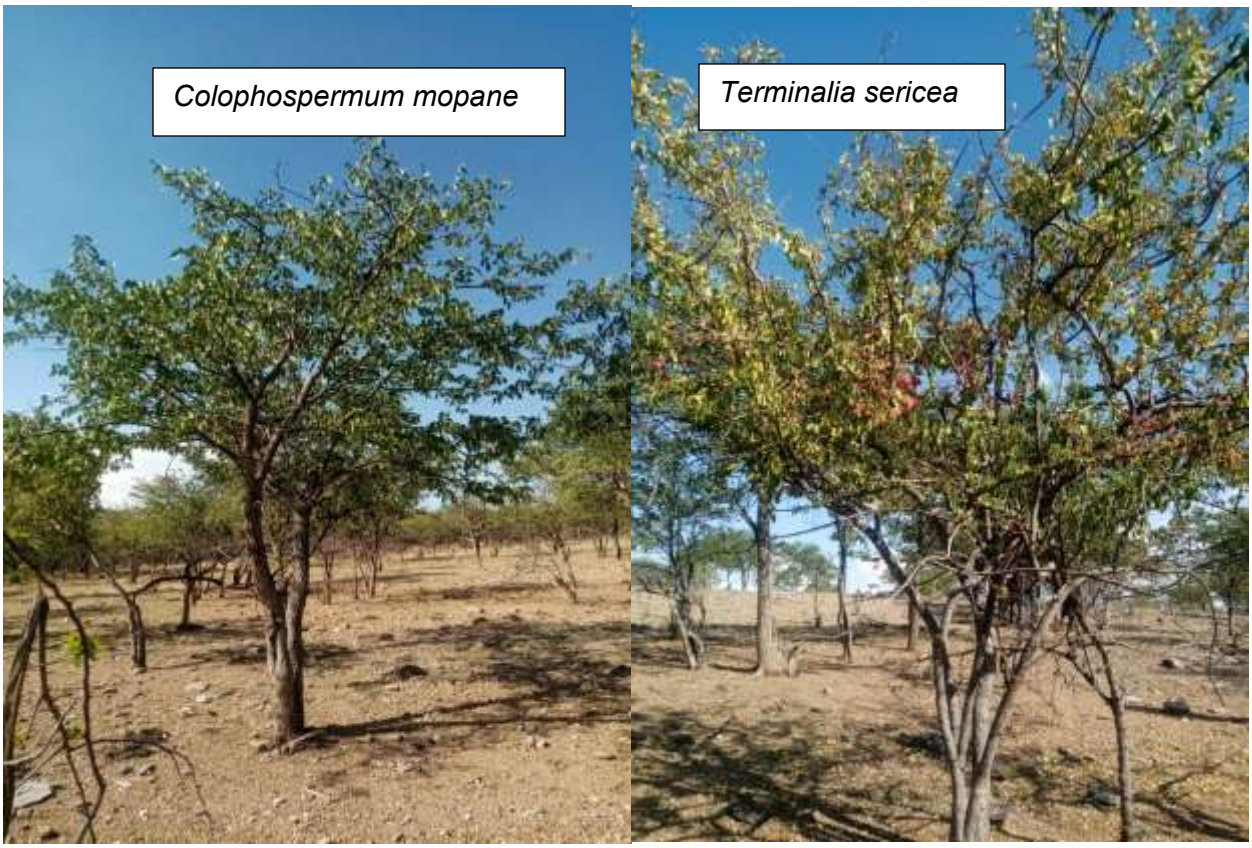

Figure 11: Tree species observed on site

Fauna

The site falls within farmland. No animal was observed onsite however, there were some kraals, footprints, and animal droppings observed on the site, which suggests that there is some livestock in the area. **Figure 12** show the animal droppings spotted on site.

Figure 11: Animal droppings (Evidence of faunal presence) on site

5.2 Heritage and Archaeology

5.2.1 Local Level and Archaeological Findings

Archaeological sites in Namibia are protected under the National Heritage Act of 2004 (No. 27 of 2004). Evidence shows that the emergence of modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch (Kinahan, 2017). Namibia has a relatively complete sequence covering the mid-Pleistocene to the Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment, and the Namib Desert.

The Kunene Region is not well explored archaeologically. Early investigations by MacCalman (1972) and MacCalman and Grobbelaar (1965) drew attention to the presence of late Pleistocene

evidence from the area, and more spectacularly, observations on stone tool use by contemporary hunter-gatherer groups. More recent investigations have documented a late Holocene occupation sequence (Albrecht et al 2001) and some of the detailed archaeological characteristics of nomadic pastoral settlement patterns in the area (Kinahan 2001). The area is also considered to have a high cultural heritage sensitivity due to the possible impact of various development initiatives on the traditional life and historical sites of the OvaHimba people (Kinahan 2013). The archaeological evidence available so far indicates that the Kunene Region will have abundant traces of Pleistocene occupation but that much of this evidence will have been displaced by sheet erosion on high-angle slopes, Holocene age material is also present within the landscape (Kinahan 2013). Also, results from this desktop assessment show that no declared sites are located near or within the site area.

Therefore, it is highly recommended that the National Heritage act, 27 of 2004 should be adhered to on-site, and a qualified archaeologist should always be on standby/call during the setting up of the site to ensure that no archaeological resources that may be discovered on site are affected/ damaged.

5.3 Surrounding Land Uses

The site falls within communal land. The Proponent +has +secured a signed agreement with the traditional authority (Oruseu Headman and Vita Royal House, Opuwo) ahead of commencement of the reforestation activities.

5.4 Socio-Economic conditions of the Okanguati area

Okanguati is a proclaimed Settlement in the north of the Kunene Region, which is approximately 120 km from Opuwo, the regional capital. Okanguati Settlement is regarded as the administration center for Epupa Constituency since the constituency office is situated in Okanguati. This settlement hosts approximately 554 residents.

Economic Activity

The economy of Okanguati area primarily revolves around Agriculture and retail. The main source of income is derived from animal sales (livestock). Other sources of income include salaries and wages and government social grants.

Potential Investment Areas

Okanguati Settlement is the gateway to Epupa Falls and it has the potential to become a tourist destination, accommodation and tourism facilities are constructed in the settlement. Other Areas for potential investment include Tourism Facilities (Lodges, Hostels, and Camping sites), Construction of roads and bridges, Construction of schools, Rural electrification, Construction of houses in the Settlement (Mass Housing Project), Construction of a service station in the Okanguati and Industrial Park for emerging local investors.

Comparative and Competitive Advantage

The competitive advantages of the Epupa Constituency and Okanguati Settlement Areas include the following:

• The constituency borders Angola, a fast-developing country in Africa. The area, if developed can create opportunities for the constituency, in terms of trade and tourism.

• The constituency borders the Atlantic Ocean and it can provide a holiday destination for tourists.

• Okanguati settlement is a gateway to the Epupa Falls, a tourist destination which has potential to boom with more activities activated in the area.

Table 3: Summary of Demographics and Socio Economy of Kunene region and Epupa Constituency:

Indicators		Values	
		Kunene	Epupa
Population Size	Males	43 603	8 378
	Females	43 253	9 318
Sex ratio: Males per 100 females		101	90
Age composition, %	Under 5 years	17	22
	5 – 14 years	25	31
	15 – 59 years	51	40
	60+ years	7	7
Literacy rate, 15+ years, %		65	29
	Never attended school	37	70

Education, 15+ years, %	Currently at school	9	6
	Left school	50	15
Labour force, 15+ years, %	In labour force	67	60
	Employed	64	81
	Unemployed	36	19
	Outside labour force	24	28
Main source of income, %	Farming	32	77
	Wages & Salaries	41	6
	Cash remittance	5	1
	Business, non-farming	8	5
	Pension	12	8
Housing conditions, % Households with	Safe water	67	29
	No toilet facility	63	92
	Electricity for lighting	32	7
	Wood/charcoal for cooking	51	78

Source: 2011 Population and Housing Census Regional Profile, Kunene Region,

6 PUBLIC CONSULTATION PROCESS

Public consultation is an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process, thus assisting the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and the extent to which further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this scoping study has been done following the EMA and its EIA Regulations.

6.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request. Newspaper advertisements of the proposed reforestation activities were placed in two widely read national newspapers in the region (New Era Newspaper and The Namibian Newspaper). The project advertisement/announcement ran for two consecutive weeks inviting members of the public to register as I&APs and submit their comments. The summary of pre-identified and registered I&APs is listed in **Table 4** below and the complete list of I&APs is provided in **Appendix D**.

Table 4: Summary of Interested and Affected Parties (I&APs)

National (Ministries and State-Owned Enterprises)
Ministry of Environment, Forestry and Tourism
Ministry of Mines and Energy
Ministry of Health and Social Services
Regional, Local, and Traditional Authorities
Kunene Regional Council
Epupa Constituency Office

General Public
Landowners /Interested members of the public
Namibia Community-Based Tourism Association

6.2 Communication with I&APs

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process and these have been used in guiding this process. Communication with I&APs with regard to the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed reforestation works was compiled and delivered to relevant Authoritative Ministries, and upon request to all newly registered Interested and Affected Parties (I&APs);
- Project Environmental Assessment notices were published in The Namibian and New Era Newspaper (12 and 19 April 2023) briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the I&APs on the 26th of April 2023 at Oruseu Water Point at 12h00.
- Issues or concerns were raised during the public consultation meeting and information obtained from the site visit, to inform the ESA Report and EMP.

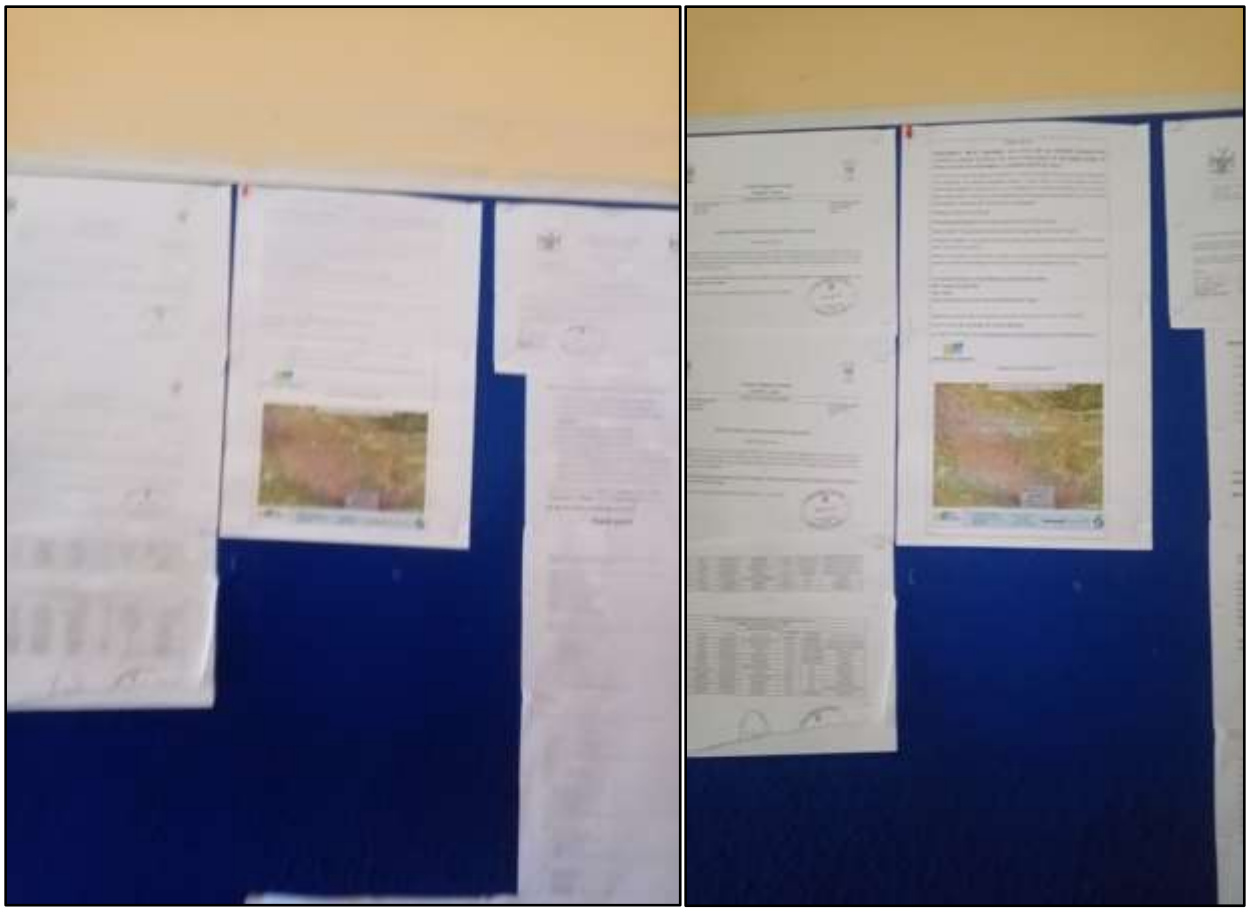

Figure 12: The site notices placed at Okanguati Constituency office

Figure 13: Public Consultation meeting at Oruseu Water Point

Issues raised by I&APs have been recorded and incorporated in the environmental report and EMP. The summarized issues raised during the public meeting are presented in **Table 5** below. The issues raised and responses by EDS are attached under **Appendix G** and **H**

Table 5: Summary of main issues raised, and comments received during public meeting engagements

Issue	**Question**
Commencement of the project	When is the proponent commencing with the project?
Corporate Social Responsibility	Establishment of a fund that will help residents
Benefits to the farmers and community members	Are there any benefits for the community members?

7 IMPACT IDENTIFICATION, ASSESSMENT, AND MITIGATION MEASURES

7.1 Impact Identification

Proposed developments/activities are usually associated with different potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified from the prospecting activities are listed as follows:

Positive impacts:

- Promotes ecological restoration and plant biodiversity in the area
- Increases aquifer levels over time providing better water security for Oruseu and potentially for surrounding villages.
- Improves the ecosystem's resilience to drought and land degradation
- Empowerment and transfer of skills to locals through training
- Enhances local food production and access (food security)
- Promotes eco-tourism in the area
- Improves Carbon sinks
- Enhances the aesthetics of the landscape

Negative impacts:

- Impact on water resources (groundwater) through abstraction to supply the proposed activities onsite.
- Environmental pollution (waste generation/littering)
- Impact on local livestock (restricted movement)
- Risk of veld fires
- Health and safety: improper handling of materials and equipment may cause occupational health hazards.
- Archaeological or cultural heritage impact through uncovering of unknown objects on site (when carrying out earthworks), Impacts on local Roads
- Social Nuisance: local property intrusion & disturbance

7.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is in accordance with Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity), and probability (likelihood of occurring), as presented in **Table 6**, **Table 7**, **Table 8,** and **Table 9**, respectively.

To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact.
- Assessment of the pre-mitigation significance of the impact; and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria were applied in this impact assessment:

7.2.1 Extent (spatial scale)

The extent is an indication of the physical and spatial scale of the impact. **Table 6** shows the rating of impact in terms of the extent of spatial scale.

Table 6: Extent or spatial impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localized within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

7.2.2 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 7** shows the rating of impact in terms of duration.

Table 7: Duration impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short-term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

7.2.3 Intensity, Magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These ratings were also taken into consideration during the assessment of severity. **Table 8** shows the rating of impact in terms of intensity, magnitude or severity.

Table 8: Intensity, magnitude or severity impact rating

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
Qualitative	Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

7.2.4 Probability of occurrence

Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment. **Table 9 s**hows impact rating in terms of probability of occurrence.

Table 9: Probability of occurrence impact rating

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.2.5 Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact "without mitigation" is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this section, for this assessment, the significance of the impact without prescribed mitigation actions is measured.

Once the above factors (**Table 6, Table 7**, **Table 8** and **Table 9**) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SIGNIFICANCE POINTS (SP) = (MAGNITUDE + DURATION + SCALE) X PROBABILITY

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (**Table 10**).

Table 10: Significance rating scale

Significance	*Environmental Significance Points*	*Colour Code*
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	1 to 30	L
Neutral	0	N
Low (negative)	-1 to -30	L
Medium (negative)	-30 to -60	M
High (negative)	-60<	H

Positive (+) – Beneficial impact

Negative (-) – Deleterious/ adverse+ Impact

Neutral – Impacts are neither beneficial nor adverse

For an impact with a significance rating of high (-ve), mitigation measures are recommended to reduce the impact to a medium (-/-ve) or low (-ve) significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the reforestation phases is done for pre-mitigation and post-mitigation.

The risk/impact assessment is driven by three factors:

Source: The cause or source of the contamination.

Pathway: The route taken by the source to reach a given receptor

Receptor: A person, animal, plant, ecosystem, property, or a controlled water source. If contamination is to cause harm or impact, it must reach a receptor.

A pollutant linkage occurs when a source, pathway, and receptor exist together. Mitigation measures aim firstly, to avoid risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once mitigation measures have been applied, the identified risk would reduce to lower significance (Booth, 2011).

This assessment focuses on the potential negative impacts stemming from the proposed activities of the site are described, assessed, and mitigation measures provided thereof. Further mitigation measures in the form of management action plans are provided in the Draft Environmental Management Plan.

7.3 Assessment of Potential Negative Impacts

The main potential negative impacts associated with the operation and maintenance phase are identified and assessed below:

7.3.1 Water Resources Use

Water resources are impacted by project developments/activities in two ways - through pollution (water quality) or over-abstraction (water quantity) or at times both.

The abstraction of more water than can be replenished from low groundwater potential areas would negatively affect the local communities (communal farmers and livestock) that depend on the same low potential groundwater resource (aquifer).

The impact of the project activities on the resources would be dependent on the water volumes required by each project activity. Reforestation activities use water, mainly for watering the seedlings and during the construction of infrastructures within the site. The project is anticipated to utilize 2000-3000L of water per day during the operational phase and less during construction.

Without the implementation of any mitigation measures, the impact can be rated as low, but upon effective implementation of the recommended measures, the impact significance would be reduced to very low/little as presented in **Table 11** below.

Table 11: Assessment of the project impact on water resource use and availability

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 2	M/H - 2	L/M - 3	M/H - 3	L - 21
Post mitigation	L/M - 1	L/M - 1	L - 2	L/M - 2	L - 8

When it is considered to abstract water from onsite water sources, it is recommended for the Proponent to obtain a permit, if necessary, as required under the Water Act No. 54 of 1956 (enforced), and the Water Resources Management Act, No. 11 of 2013.

7.3.2 Soil and Water Resources Pollution

The proposed reforestation activities are associated with limited potential pollution sources that may contaminate/pollute soil, and surface/ground water. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project equipment's .

The spills (depending on volumes spilled on the soils) could infiltrate the soils and may be harmful to fractured or faulted aquifers on site, and with time reach further groundwater systems in the area. However, it should be noted that the scale and extent/footprint of the activities where potential sources of pollution will be handled is relatively small as the project will use only electric vehicles and also will not use any chemicals, fertilizers or pesticides in construction or operation. Therefore, the impact will be low.

Pre-implementation of any mitigation measures, the impact significance is low and upon implementation, the significance will be reduced to very low. The impact is assessed in **Table 12** below.

Table12: Assessment of the project impact on soils and water resources (pollution)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance

Pre mitigation	M - 3	M/L - 2	M/L - 2	M - 4	L- 28
Post mitigation	L - 1	M - 2	L - 1	L/M - 2	L - 8

7.3.1 Waste Generation

During the reforestation program, domestic and general waste is produced on-site. If the generated waste is not disposed of responsibly, land pollution may occur around the sites. The site is in an area of moderate sensitivity to pollution. There is a need for appropriate waste management for the site. To prevent these issues, any waste that may have an impact on animals, vegetation, water resources, and the general environment should be handled cautiously. It is worth noting that this is an environmental organization that uses mainly biodegrable packaging and purchases in bulk to reduce waste. Without any mitigation measures, the general impact of waste generation has a low significance. The impact will reduce to very low significance, upon implementing the mitigation measures. The assessment of this impact is given in **Table 13.**

Table 13: Assessment of waste generation impact

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M - 5	M – 50
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L – 8

7.3.1 Disturbance to the local livestock (Movement restriction)

The reafforestation site lies within communal land and the site will be fenced off. Reforestation activities such as site clearing and fencing off the area can potentially lead to the disturbance of grazing movement. This would affect the grazing land available to livestock, and since they greatly depend on the little available flora, their livelihood may be impacted. The project is located in an elevated position and therefore is not in the grazing or migration path of local fauna.

Under the status quo, the impact can consider being of a low significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a very lower/little significance. The impact is assessed in **Table 14** below.

Table 14: Assessment of the impacts of reforestation on grazing areas

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -2	M: -2	M/H: 3	L: -21
Post mitigation	L/M: -1	L/M: -1	L/M: -1	L/M: 2	L: -6

7.3.2 Occupational Health and Safety Risks (i.e., Veld Fire)

Project personnel (workers) involved in these activities may be exposed to health and safety risks. These may result from accidental injury, owing to either minor (i.e., superficial physical injury) or major (i.e., involving machinery or vehicles) accidents. The site safety of all personnel is the Proponent's responsibility and should be adhered to as per the requirements of the Labour Act (No. 11 of 2007) and the Public Health Act (No. 36 of 1919). Vehicles and equipment should be properly secured to prevent any harm or injury to the project workers or animals.

The presence of hydrocarbons of any kind presents a risk of fire outbreaks, which could pose a safety risk to the project personnel, equipment, and vehicles. It may also lead to widespread veld fires if an outbreak is not contained, the safety risk may be a concern for project workers and residents.

The impact is probable and has a low significance rating. However, with adequate mitigation measures, the impact rating will be reduced to very low/little. This impact is assessed in **Table 15** below and mitigation measures are provided.

Table 15: Assessment of the impacts of reforestation on health and safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance

Pre mitigation	M – 3	M/L - 2	M - 2	M/H - 3	L – 21
Post mitigation	L/M - 1	L/M - 1	L - 2	L/M - 2	L - 8

7.3.3 Disturbance to Archaeological and Heritage resources

The Kunene Region contains archeological/cultural significant sites, and there is a possibility of unveiling/discovering new archeological and/or cultural materials in the proposed project area. If such materials are found, the areas must be mapped out and coordinates taken to establish "No-Go-Areas", due to their sensitivity, and then documented. They may be protected either by fencing them off or demarcation for preservation purposes, or excluding them from any development i.e., no reforestation activities should be conducted near these recorded areas through the establishment of buffer zones. This project will not require any excavation and will incorporate shallow manual digging only for installation of fencing and other infrastructure.

This impact can be rated as medium significance if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance will be reduced to a lower rating. The impact is assessed in **Table 16.**

Table 16: Assessment of the impacts of reforestation on archaeological & heritage resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M/H - 4	M – 52
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

7.3.4 Social Nuisance: Local Property Intrusion and Disturbance/Damage

The presence of some non-resident workers may lead to social annoyance to the local community. This could particularly be a concern if they enter or damage private property. The private properties of the locals may include houses, fences, vegetation, livestock, wildlife, or any properties of economic or cultural value to the farm/land owners or land users. Unpermitted and unauthorized entry to private property may cause crashes between the affected property (landowners and the Proponent. Four non-resident volunteer envirinmentalists only, are likely to reside at the property allocated for the project

The impact is rated as of low significance. However, upon mitigation (post-mitigation), the significance will change from a low to a very low/little rating. The impact is assessed and presented in Table **17.**

Table 17: Assessment of the social impact of community property damage or disturbance

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 2	M - 3	M - 4	M/H – 3	L – 27
Post mitigation	L - 1	L - 1	M/L - 4	M/L -2	L - 12

8 RECOMMENDATIONS AND CONCLUSION

8.1 Recommendations

The potential positive and negative impacts of the proposed reforestation activities in Oruseu village were identified and assessed, and appropriate management and mitigation measures were provided thereof, for implementation by the Proponent, their contractors, and project-related employees.

Mitigation measures to the identified impacts have been provided in the Environmental Management Plan, in order for the Proponent to avoid and/or minimize their significance of impacts on the environmental and social components. With effective implementation of the recommended management and mitigation measures, a reduced rating in the general significance of all adverse impacts is expected from low to little low. Most of the potential impacts were in fact determined to be of positive impact to the community and region. To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer. Monitoring of implementation will not only be done to maintain low ratings, but also to ensure that all potential impacts identified in this study, and other impacts that might arise during implementation are properly identified in time and addressed right away.

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by effective implementation of the recommended management and mitigation measures, and with effort and commitment towards monitoring the implementation of these measures.

It is, therefore, recommended that in the case of granting an ECC for this project, the proposed reforestation activities may be granted an ECC, provided that:

- All the management and mitigation measures provided in the EMP are effectively and progressively implemented.
- All required permits, licenses, and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensure compliance with these specific legal requirements.

- The Proponent and all project workers and contractors must comply with the legal requirements governing the project and ensure that all required permits and or approvals are obtained and renewed as stipulated by the issuing authorities.

8.2 Conclusion

It is critical for the proponent and their contractors effectively implement the recommended management and mitigation measures, in order to protect the biophysical and social environment throughout the project duration. This would be done to promote environmental sustainability while ensuring a smooth and harmonious existence and purpose of the project activities in the community and environment at large. It is also to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed accordingly. Lastly, should the ECC be issued, the Proponent will be expected to be compliant with the ECC conditions as well as legal requirements governing the proposed reforestation and related activities.

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Indigenous food-producing plants of Namibia										
Trees										
Scientific name	**Family**	**English name**	**Alternative names**	**Himba name**	**Edible parts**	**Nutrients**	**Drought resistance**	**Native distribution**	**Notes**	**Growth rate**
Acacia nilotica	Fabaceae	Gum Arabic Tree			The young pods, young leaves and shoots are used as vegetables. The sprouted seeds are consumed. Medicine for sore throat, cough, chest pains, dysentery and stomach ulcers					
Adansonia digitata	Malvaceae	Baobab	Omakwa, monkey-bread tree, upside-down tree, cream of tartar tree, dead-rat tree	Omuzu	Fruits, leaves. The pulp around the seed is eaten when dry. The pulp is left in water to soften to make a very delicious porridge	Protein, amino-acids, vitamin A, riboflavin, vitamin C; calcium, iron, potassium, magnesium, manganese, molybdenum, phosphorus	Drought resistance	Namibia native		Relatively fast rate of growth. Seeds germinate easily.

Balanites angolensis	Zygophyllaceae	Angola green-thorn		Omutungambara	edible fruit, fencing, roots used to treat breast complaints in nursing mothers					
Bauhinia petersiana	Fabaceae	white bauhinia	koffiebos, muhusi, mupondo	Omutiuakatjipera	Young green pods roasted in ash, and beans eaten ; mature beans roasted and eaten as snacks; roasted beans used as a coffee; roots are roasteed, and the root cortex eaten as a 'meat'				? Nitrogen fixer	
Berchemia discolor	Rhamnaceae	Eembe	Bird plum, brown ivory	Omuve	Very sweet fruit; abundant fruits are dried for storage; dry or fresh fruit pulped in water, kernels removed, pulp eaten as porridge, or fermented for beer.	Vitamin C, Potassium, Sugar, Calcium, Magnesium	Drought resistant	Namibia, Angola, Botswana, South Africa	Fruit and bark traditional cure for infertility	60–80 cm/year; Mature tree up to 20 m tall
Boscia albitrunca	Brassicaceae	Shepherd tree	Omunkunzi, Tree of Life	Omutendereti	Edible berries (small fruits), roots used to make porridge and a coffeelike drink; flower buds used as caper substitute to make pickle		Hardy and drought-resistant. It is easily propagated and grows from shoot and root cuttings.	Namibia etc.	Roots used to treat hemorroids and make beer	

Boscia foetida subsp. foetida	Capparaceae	Stink shepherd's tree	Bushveld shepherds tree, Smelly shepherds tree	Otjinautoni	Edible berries 1 cm in size, roots pounded and made into a porridge.		Grows on rocky, semidesert or dry soil	Namibia	Known for the particularly unpleasant smell of its flowers which appear during early spring, to which its specific name foetida alludes	Small tree 1-3 m high, 3 m wide
Carissa bispinosa	Apocynaceae	Common Num-num			Fruit, sweet when ripe					
Clerodendrum glabrum	Lamiaceae	Smooth Tinderwood			Fruit. Treatment of cold, cough and colic. Root used as snake bite remedy. Also used to treat arthritis and rheumatism					
Combretum hereroense	Combretaceae	Mouse-eared Combretum		Omutapati	Edible gum, fruit, dried leaves used in tea, roots used in medicine.					
Commiphora africana	Burseraceae	African Myrrh		Ongareya	sap quenches thirst, gum is edible. Leaves and roots used to treat snake bites.					
Commiphora angolensis	Burseraceae	Sand Corkwood			Fruit, moisture in bark					

Cordia sinensis	Boraginaceae	Grey-leaved Saucer-berry	omusepa, omupombo	Omupombo	Fruit is edible, sweet and abundant; is very sticky, but widely enjoyed. Used to clean teeth.			Namibia, India etc.		Grows up to 9m
Dialium engleranum	Fabaceae	Kalahari podberry	Omufimba, nonsimba, thimba	Omutjimba	Fruit			Namibia		Tree up to 20 m
Diospyros lycioides	Ebenaceae	Bluebush	Star-apple, monkey plum	Omuryambandje	Raw fruit; roasted seeds used to make coffee-like drink		Likes well-drained and rocky soil	Namibia	Roots/twigs used to make toothbrushes; antibacterial; wood used for construction and spoons	Height 3-5 m; produces fruit after 4+ years
Diospyros mespiliformis	Ebenaceae	Jackalberry	African ebony, Jakkalsbessie, Eenyandi, Omwandi	Omunyandi	Fruits used to increase nutritional value of baby porridge. Fruit pulp is soft and very sweet. Normally consumed while fresh. The remaining fruits are dried and consumed at a later time	Vitamin C, carbohydrates, minerals	Drought resistant, grows on sandy soil	Savannahs in the eastern part of the African continent, from Ethiopia to the south of Swaziland	Lemony taste; termite symbiotic(mutualism); leaves, roots and bark have tannin which stops bleeeding; roots purge parasites. symbiotic with termites.	Adult tree 4-25 m. fairly slow growing and requires plenty of water to speed up the growth rate
Dombeya rotundifolia	Malvaceae	Wild Pear		Omuryahere	Fruit					
Elaeodendron	Celastraceae	Bushveld Saffron		Omupya	Edible fruit, bark infusion used to treat skin problem					

transvaalense					and relieve stomach cramps. Best grown on lime.					
Erythrina decora	Fabaceae	Namib Coral Tree			Edible beans. Medicine for cough.					
Euclea pseudebenus	Ebenaceae	Ebony guarri	Cape ebony, false ebony, black cape ebony, wild ebony tree, Ebenholzbaum	Omuzema	Fruits are edible when ripe…astringent taste		Drought resistance	Namibia native	Roots and twigs used for toothpicks	
Faidherbia albida, (formerly Acacia albida)	Fabaceae	Ana tree	Acacia albida, apple-ring acacia, gao tree, winter thorn	Omue	Edible seeds and gum			Namibia native		
Ficus capreifolia	Moraceae	River Sandpaper Fig		Omuzuva kuvare	Fruit					
Ficus ilicina	Moraceae	Laurel Fig		Omupendarwa	Small but edible fruit, great in rocky soil					
Ficus sycomorus	Moraceae	Sycamore fig	Fig-mulberry, Omukwiyu	Omukuyu	Fruit			Namibia, Lebanon, most of Africa	Leaves and twigs medicinal	Grows to 20 m tall
Gardenia volkensii	Rubiaceae:	Savanna Gardenia		Omundano	Fruit					
Guibourtia coleosperma	Fabaceae	African rosewood	Large false mopane. Omushii, machibi		Fruit to increase nutritional value of infant porridge; The red aril is edible,			Namibia etc.		Up to 20 m

					and soup is made from the arils. Seeds are baked and pounded and cooked as porridge.					
Hyphaene petersiana	Arecaceae	Makalani palm	Real fan palm, Omulunga		Fruit which has liquid similar to coconut milk		Grows in the savannah or in secondary veg-etation; it grows on sodic-saline alluvial soils with high watertables	Namibia, South Africa, Botswana etc.	Leaves used as toothbrushes and to weave baskets; fruit used to make liquor	Grows up to 20m tall
Kigelia africana	Bignoniaceae	Sausage tree	Cucumber tree, worsboom		Fruits have to be dried or roasted… poisonous when raw. Seeds can be roasted and eaten.			Namibia etc.		
Kirka acuminata	Kirkiaceae	Common Kirkia		Omuhoho	sweet sap quenches thirst, roots are chewed to quench thirst. Mountains and rocky out crops.					
Maerua juncea	Capparidaceae	Rough-skinned bush cherry		Orueti	Fruit					
Maerua schinzii	Capparidaceae	Ringwood	Kringboom	Omuhasuvirua	Fruit					

Manilkara mochisia	Sapotaceae	Lowveld Milkberry			Fruit					
Moringa ovalifolia	Moringaceae	Moringa	Sprokies boom (fairytale tree)	Omutindi	Pods, leaves, seeds, roots, sap	Potassium, protein, beta carotene	Drought tolerant	Namibia escarpment	Nitrogen fixer, viagra seeds	
Mystroxylon aethiopicum	Celastraceae	Kooboo berry			Fruit					
Olea europaea subsp. Africana	Oleaceae	Wild Olive		Omuninga	Olives. Leaves are used for tea.					
Ozoroa insignis	Anacardiaceae	African Resin Tree		Omutareka	Fruit					
Pappea capensis	Sapindaceae	Jacket Plum			Edible fruit, can prepare jellies. Oil of seed has similar effect to castor oil.					
Parinari curatellifolia	Chrysobalanaceae	Mobolo plum			Fruit is eaten; this is one of the major southern African fruit trees,		Grows in central Caprivi, and east of that. Not sure how well it will do in more arid env, but well worth a trial	Namibia native		

Piliostigma thonningii	Fabaceae	monkey bread	mupapama, omtuutuu		Pounded pods are nutritious; eaten in times of famine			Namibia	? Nitrogen fixer	
Schinziophyton rautanenii (formerly Ricinodendron rautanenii)	Euphorbiaceae	Mongongo	Manketti nut, Omunkete	Omungeti	Outer flesh/pulp of the fruit is a relish, eaten raw or cooked. The nut/kernel which is rich in Vitamin E, is finely crushed and added to vegetables. The protein content of the nut is nearly 30%	Vitamin E, linoleic acid, erucic acid, nervonic acid , protein, calcium, magnesium	Can withstand several years of drought	northern Namibia, Botswana, Zambia, Zimbabwe	Stores for long periods	
Sclerocarya birrea	Anacardiaceae	Marula	Omwoongo, Omugongo, Umganu, mufula, Inkanyi	Omungongo	Fruits edible, kernels used for oil	Vitamin C, Protein, calcium, magnesium, phosphorus, potassium,	Drought tolerant; grows on sandy and loamy(clay) soils	Subspecies Caffra native to Africa from Ethiopia to SA and Senegal	Traditional flu medicine; fruit harvest Dec-Mar. Three subspecies: birrea, caffra and multifoliolata. Bark has many medicinal uses. Separate male and female trees; a male must be planted in vicinity of females for fruit to develop.	Growth rate of up to 1.5 m per year

Searsia cilata	Anacardiaceae	Sour Karee		Okasauroro	Eible sour fruit					
Searsia quartiniana	Anacardiaceae	Ribver Rhus		Omuryangwari	Fruit					
Sterculia africana	Malvaceae	African Star-chestnut		Omuhako	Edible chest nuts that can be roasted. Need to avoid irritating hairs on fruit capsules.					
Sterculia quinqueloba	Malvaceae	Large-leaved Stercule a		Omuhako	Edible seeds, can be roasted and pounded					
Strychnos cocculoides	Loganiaceae	Corky Monkey orange	Kavango Lemon		Fruit, seeds	Vitamin C, zinc, iron, magnesium	Drought-tolerant	Southern Africa	Taste similar to orange-banana	
Strychnos pungens	Loganiaceae	Spine-leaved monkey-orange	Omupwaka	Omuhuruhuru	Fruit pulp, but seeds poisonous	Citric acid; Mg, Na, Zn, K, and Cu	Drought-tolerant; typically grows in mixed woodland or in rocky places	northern Namibia, South Africa, Botswana	Watch out for the seeds	Adult about 5m tall
Strychnos spinosa	Loganiaceae	Spiny Monkey-orange	Green monkey orange, natal orange, spiny orange, klapper, morapa, Omuuni		Fruit	Vitamin C, Potassium, Sodium	Drought-tolerant	Prefers Bushveld(woodland)… South Africa, Botswana. Also northern Namibia	Medicine for snakebites, low lactation. Green when unripe and ripens to orange	

Syzigium guineense	Myrtaceae	Water pear	Water berry	Omuhombo	Fruits and Leaves.					
Tamarix usneoides	Tamaricaceae	Wild Tamarisk		Omungwati	Edible pods					
Terminalia prunioides	Combretaceae	Purple-pod Terminalia		Omuhama	Sweet, edible gum, bark chewed and sap swallowed to relieve coughs and sore throat.					
Vachellia erioloba (formerly Acacia erioloba)	Fabaceae	Camel thorn	Giraffe thorn, Acacia erioloba	Omumbonde	Fruit+E16:E30s, pods pulp edible		Very drought hardy		Seeds used to make coffeelike drink	
Vachellia tortilis ssp. heteracantha	Fabaceae	Umbrella thorn acacia	Basterkameeldoring, krulpeul, Afrikaans: haak-en-steek, Hebrew: Shitat ha'sochech	Orupungu ya	Pod pulp without the seeds is made into a porridge by the Namibia Topnaar. Gum also edible.		Tolerates drought, wind, salinity and a wide range of soil types	Namibia, Israel, most of Africa	Nitrogen fixer	
Vangueria infausta	Rubiaceae	Medlar	African medlar	Omundjen ya	Raw fruit, roasted seeds, fruit dried and stored	Potassium, calcium, phosphorus, magnesium and iron	Drought resistant	Namibia, South Africa, Botswana etc.		
Ximenia americana	Olacaceae	Tallow wood	Hog plum, yellow plum, sea lemon, Oshikukulu	Omuninga	Yellow, orange or red fruit			Namibia	Traditional hair product made from seed oil. Roots, barks and leaves	

									used in traditional medicine	
Ximenia caffra	Olacaceae	Sourplum	Wild plum, large sourplum, mtundakula, mpingi, Oshimbyupeke	Omumbeke	Red fruit edible	Oleic acid, Potassium, protein, vitamin C, amino acids; rich in ascorbic acid	Seedlings vulnerable to drought and animal grazing; adult tree moderately drought tolerant	Namibia	Kernel is edible and is used to make jam. Is rich in protein, and has as much oleic acid as olive oil	
Ziziphus mucronata	Rhamnaceae	Buffalo thorn	Omukekete	Omukaru	Fruit, young leaves			Namibia		Reaches 10 m
Shrubs/ Bushes										
Azima tetracantha	Salvadoraceae	Bee Sting Bush	Four-thorns	Onyarawongwe	Fruit					
Capparis hereroensis	Capparaceae	Namib Caper	Herero caper bush, Siirub		Fruit.					
Commiphora krauseliana	Burseraceae	Feather-leaved Corkwood		Omumbungu	Fruit					
Commiphora pyracanthoides	Burseraceae	Firethorn Corkwood			roots are edible when bark is removed, gum is edible. Elephants may dig up roots.					
Commiphora saxicola	Burseraceae	Rock Corkwood		Omumdomba	fruit edible, stem chewed as a thirst quencher, leaf					

					extract has anti-tumor properties					
Diospyros chamaethamnus	Ebenaceae	Sand Apple	Dwarf Jackal-berry		Fruit					
Flueggea virosa	Phyllanthaceae	Whiteberry Bush		Okahunokondo	Fruit					
Grewia avellana	Tiliaceae (jute family)	Omukopakopa	Muzunzunvani	Omatakowavatwa	Fruit					Shrub grows up to 2m
Grewia bicolor	Tiliaceae	Two-coloured Grewia			Fruit					
Grewia flava	Tiliaceae (jute family)	velvet raisin bush	omuvapu, ehonga, rupoundu,	Omuvapu	abundant fruit, dry leaves used as a pleasant-tasting health tea, and as a beverage in place of coffee					
Grewia flavescens	Tiliaceae (jute family)	Sandpaper Raisin	Omushe	Omuhe	Fruit					
Grewia Olukondae	Tiliaceae	Soft-leaved raisin		Omuhe	Fruit					
Grewia retinervis	Tiliaceae	Kalahari Raisin Bush		Omuhe	Fruit, sweet taste similar to raisin, good fresh or dried					
Grewia schinzii	Tiliaceae (jute family)	Shaggy Raisin	Omushe	Omuhore	Fruit			Namibia		Grows around 3m high
Grewia subspathulata	Tiliaceae	False Grey Raisin		Omupundukaina	Fruit					
Grewia tenax	Tiliaceae	Small-leaved	White Crossberry	Omundjendjere	Fruit (berry) eaten raw		Grows in semi-	Namibia, India		Shrub up to 2 m tall

		white raisin					desert areas			
Grewia villosa	Tiliaceae	Mallow Raisin		Omanjembere	Fruit					
Ipomoea adenioides	Convolvulaceae	Trumpet-flower		Omuti-wotjipindo	Edible roots					
Lannea discolor	Anacardiaceae	Live-long		Omundjimune	Fruit. Bark and roots are medicinal.					
Lycium cinereum	Solanaceae	Boxthorn	Bokdoring, kraaldoring, slangbessie, hebrew: Atad		Fruit when ripe			Namibia etc.		
Ochna pulchra	Ochnaceae	peeling bark ochna	muzwe, eruvize, munyelenye le	Eruvize	ripe fruit cooked and eaten; has very high edible oil content - oil is skimmed off boiling fruit and used as cooking and edible oil		drough-resitant			
Parinari capensis	Chrysobalanaceae	Dwarf Mobola Plum	Muchkatapasi		Fruit raw or dried. Juice can be enjoyed or concentrated as a gruel.					
Pygmaeothamnus zeyheri	Rubiaceae	Sand Apple	Goorappel		Fruit, sweet flavor.					
Salacia luebbertii	Celastraceae	Salacia	Okandongondongo		Edible fruit		Grows in Kalahari Sand	Namibia etc.	Roots mix used to treat chest pains; leaves as a general medicine; related Salacia species	50 cm bush

									used medically in Indian ayurveda	
Salvadora persica	Salvadoraceae	Toothbrush tree	Salt bush, mustard tree	Omungambu	Raw fruits smell like cress, are edible, but cause diarrhea. Dried fruits are used as a knapsack food for travellers.		drought-resistant	Namibia native	Fruits edible but cause diarrhea	
Searsia pyroides	Anacardiaceae	Firethorn Rhus			Fruit					
Searsia tenuinervis	Anacardiaceae	Kalahari Currant		Omutaareka	Sour edible fruit					
Talinum caffrum & Talinum crispatulum	Portulacaceae	Porcupine Root			Fresh leaves are stripped off the stems and eaten directly; or fresh leaves are pounded to make a pesto-like relish					
Tylosema esculenta	Fabaceae	Morama bean			Roasted beans, young roots.		Huge undergroud tuber develops, drought-resistant	Namibia, Botswana	Young tubers are edible; the beans are delicious. Propagation studies have been done; strong interest in agriculture to make marama beans a commercial species.	

Vangueria cyanescens	Rubiaceae	Kalahari Wild Medlar		Omundjenya	Fruit					
Welwitschia mirabilis	Welwitschiaceae	Welwitschia, tree tumbo		Onyanga	Cone. Indigenous people eat the cone of this plant by eating it raw or baking it in hot ashes. One of its names, onyanga translates to 'onion of the desert'		Endemic to Kaokoveld desert, an area with almost zero rainfall. Populations tend to occur in ephemeral watercourses, indicating a dependence on groundwater in addition to precipitation from fog.	Namib desert	Can grow up over 1,000 years. Only has a single pair of leaves.	Can be grown from seed
Desert vines										
Acanthosicyos horridus	Cucurbitaceae	Nara (!Nara)	Botterpitte	Omungaraha	Namibia's indigenous, edible desert melon		Creates hummocks(hills) in sandy desert,	Namibia only	significant for ecosystem. Provides food for	Grows on wild, communal nara fields.

							but never on stony plains. Can survive many years without water thanks to extensive root system.		many species	Cultivation dnly beginning to be research ednown
Acanthosicyos naudinianus	Cucurbitaceae	gemsbok cucumber			ripe fruit consumed raw, or roasted.					
Citrullus ecirrhosus	Cucurbitaceae	Tsamma melon	Namib tsamma, bitter apple		Melon fruit roasted and eaten; seeds edible		desert melon	Namibia	Namibian Ovambo mix oil from the seed with red ochre to make a cosmetic	
Citrullus lanatus	Cucurbitaceae	Tsamma melon	Etanga		Melon eaten ; seeds pounded and eaten. This is the most important spcies of Tsamma melon				Fruit can be stored for up to 7 months. Note that non-bitter varieties must be selected for cultivation	
Cucumis metuliferus	Cucurbitaceae	African horned cucumber	Jelly melon, spiked melon		Melon eaten, peel sometimes eaten	Peel is rich in vitamin C and fiber, fruit good source of				

						iron, magnesium, water during dry season				
Pergularia daemia	Apocynaceae	Trellis-vine			Leaves eaten in South Africa as a wild spinach. Many medicinal uses				medicinal uses (analgesic, laxative, treats infantile diarrhea, antiparasite etc.)	
Vigna Vexillata (sub sp. Lobatifolia)	Fabaceae	Zombi Pea	Wild cowpea		Edible tubers (used as cover crop)					